CONTROL-LINE MODEL AEROPLANE

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BASIC FLYING INSTRUCTIONS

The Basics

A control-line model aeroplane is flown in a circle with the pilot standing at its centre holding the control handle. The aeroplane flies around the perimeter of the circle at the end of two control wires that are attached to the control handle. These wires control the elevator of the aeroplane and, on more complex models, wing flaps, that manoeuvre the aeroplane up and down.

Flying Equipment

The flying equipment consists of a handle and two wires. The length of each wire should be equal and about 9m (30') to 18m (60') long. The actual length will depend on the model to be flown. Larger, more powerful models require longer lines. The shorter the wires, the greater the pulling force of the aeroplane. This decreases the tendency for the lines to become slack although you have to turn around quicker.

The ends of the lines should made up as shown in the instructions that come with the wire and/or handle. A good idea is to colour-code the control handle and the ends of the control lines and lead-out wires. You could mark red for up and black for down.

You will also need a starter battery for the engine, glow-plug lead, fuel, a fuel squeeze bottle, and starter stick.

Flying a control line aeroplane requires two people, one is the "pilot" while the other is the assistant.

Location

Control-line aeroplanes fly from 30kph (20mph) to 200kph (120mph). This high speed, along with the model's relatively small size, demands a fairly flat and smooth flying site. Any paved surface is ideal; second best is packed earth; and third best is an area covered with very short grass. You will need a clear area at least 40m (120') in diameter (the larger the better). The site must be clear of all obstructions any well away from power lines.

Be certain that the noise of the aeroplane's engine will not disturb anyone, which means no flying very early in the morning or late at night. Be sure also that the operation of your model will not interfere with the normal use of the flying site. Spectators must be kept well clear of the flying circle.

Weather

Control-line aeroplanes should be flown in relatively calm weather. Rain does not greatly upset their performance but makes for a less enjoyable day. Wind is the biggest adverse factor. Most control-line aeroplanes can not be flown in winds approaching speeds of 10kts (12mph). Ideally the wind speed should be less than 5kts (6mph). If the wind speed is too high your model will be blown back towards you when it is up-wind. This will slacken the control lines and you could loose control of the aeroplane, most probably resulting in a crash.

Pre-flight Briefing

The success and safety of control-line flying is dependent on you being thorough and methodical in your approach. Always make sure that your assistant knows what his or her responsibilities are and what you intend to do before you do it. Safety is most important, not just for yourself, but also your assistant and others in the vicinity.

There are dangers in flying control-line model aircraft. Some of these dangers are-

- They must not be flown near power lines.
- The control system could break allowing the aeroplane to fly free and cause injury to people nearby.
- A propeller blade could break off at high speed and cause injury to people nearby.
- If spectators are not kept clear, the aeroplane could hit and injure a person.
- After flying, the engine is very hot and could burn a person who touches it.

Set-up

Control-line aeroplanes normally fly in an anticlockwise direction when looking from above. Place the control handle in the centre of the flight circle. Place the model at the outside of the flight circle facing downwind, so that, when released, the aeroplane will run with the wind and not against it. As the aeroplane is gaining speed after takeoff, it will be downwind helping to keep the control lines tight.

Pre-flight Check

First check the strength of the control lines. Walk to the centre of the flying circle. With your assistant holding the fuselage of the aeroplane firmly with both hands near the wing, pick up the control handle pull with a force at least four times the weight of the aeroplane. This is to ensure that there are no weak points in the materials or connections between the control handle and bellcrank mount.

With your assistant still holding the aeroplane, check the controls such that the elevator moves up when you raise the control handle and down when you lower the control handle. Place the control handle back on the ground in such a way that when picked up for flying it will be in the proper position in your hand.

Starting

Following the engine manufacturer's directions, start the engine, and adjust the throttle to the desired position.

Takeoff

There are two types of takeoff procedures, each depends on the type of model you are flying. One type of model has an undercarriage while the other type does not.

With Undercarriage

With the engine running smoothly, have your assistant hold the tail of the model on the ground. Return to the centre of the flying circle and pick up the control handle. Check the controls again, as well as the flight area to be sure it is clear. Holding the control handle in the neutral position, with lines taut, signal your assistant to release, not push, the model.

Upon release, the model will leap forward. Holding your arm straight out horizontally before you, follow the model, facing it at all times. Do not try to "lift" the aeroplane off the ground. It will take off by itself so long as the controls are neutral and if the model is properly balanced. The average model is airborne after a run of from 1.5m (5') to 4.5m (15'). As soon as the wheels are off the ground, be alert for any tendency of the model to climb abruptly.

Without Undercarriage

With the engine running smoothly, have your assistant hold the model at arms length about shoulder height. Return to the centre of the flying circle and pick up the control handle. Check the controls again, as well as the flight area to be sure it is clear. Holding the control handle in the neutral position, with lines taut, signal your assistant to release, not throw, the model.

Upon release, the model will leap forward. Holding your arm straight out horizontally before you, follow the model, facing it at all times. The model may have a tendency to drop slightly immediately after it is released. Do not try to "lift" the aeroplane. It will soon stabilise by itself so long as the controls are neutral and if the model is properly balanced. The average model is stable after flying from 1.5m (5') to 4.5m (15').

Flying

All controlling should be done gently by raising or lowering the arm, using the shoulder as the pivot. Unless absolutely necessary, do not actuate the controls for the first several laps except to maintain an altitude of about 2m (7') to 3m (10') above the ground. Always face the model and do not look at the ground or other fixed objects, though you must be aware of their existence. Keep your eyes on the model to avoid dizziness.

Try to sense the direction and strength of the wind. This is important because a model will tend to climb when it flies into the wind and loose altitude when it flies with the wind. Raise your arm as the model approaches the downwind half of the circle, and lower your arm as the craft nears the upwind half. Otherwise, the model will oscillate more and more during each lap and invariably smash into the ground. If performed gently, the model will maintain a steady altitude during flight. This should be your objective for the first half dozen flights of every new model aeroplane that you fly. Once you have the "feel" of the model's characteristics, up and down elevation can be applied by raising and lowering the arm.

Every good C/L pilot should be ready at all times during any flight to take a step backward in the event that the lines slacken. This will automatically tighten the lines and maintain control. Control lines will become slack when the model begins to move towards the centre of the flight circle. This usually happens when the model is flying at a fairly high altitude (control line forms an angle greater than 45° with the ground), or during that portion of the circle when the wind is blowing into the pilot's face. Always turn with the model and even lead it slightly.

Landing

Some say all landings are just controlled crashes!

You will have to wait until the fuel tank is empty before landing your handiwork. Most engines speed up slightly when the fuel is depleting because the fuel-air mixture becomes "lean". Then the engine will stop. When this happens, you must continue to turn with the model as it settles towards the ground. You may have to take a step or two backward to keep the control lines reasonably tight. Many student pilot incorrectly try and keep the plane away from the ground. However, controls should be in neutral, and generally, when the aeroplane is about 1m (3') above the ground, very slight up elevator will bring the aeroplane down for a three-point landing. Be careful, when applying the up elevator, not to apply too much or the aeroplane will stall, loose flying speed, and fall to the ground.

Models without an undercarriage should be flown only on grassed areas. This will help to prevent damage during landing.

You will be most fortunate if you do not crash your aeroplane during the first few attempts at flying. We all have to start somewhere.

Advanced C/L Flying

These instructions cover only the very basics of C/L flying. Once you have mastered the basics, you can get into many different areas of C/L flying.

These include-

- Stunt

  Stunts include wingovers, inside loops, inverted flight, outside loops, square loops, horizontal eights, and vertical eights (yes the aeroplane still flies with the control lines twisted).

- Speed

  Specially designed and built aeroplanes designed for pure speed.

- Combat

  Two aeroplanes flying in the one flying circle with one trying to cut a ribbon on the tail of the other aeroplane.

- Scale

  Model aeroplanes that look as close as possible to the full-size real thing and still posses good flying characteristic.

- Endurance

  Specially built aeroplanes designed to fly the longest on a minimum amount of fuel.

- Carrier Landing

  Model aeroplanes fitted with a tail landing hook and engine shutoff for simulated landing on the deck of an aircraft carried.